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ABSTRACT

Using the instructional development tasks involved in the Dental Auxiliary Education Project of the state of Washington to illustrate its points, this paper discusses how different levels of decision-making affect the design of instructional products. Four specific levels are considered in relation to the major design problems encountered in stating objectives, selecting media, sequencing content, evaluating performance, and organizing the development process: (1) the student level, (2) the teacher level, (3) the curriculum level, and (4) the institution level. (JD)

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LEVELS OF DECISION-MAKING IN INSTRUCTIONAL DEVELOPMENT

by

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LEVELS OF DECISION-MAKING IN INSTRUCTIONAL DEVELOPMENT

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INTRODUCTION

Of all the responsibilities that may be assumed by an instructional designer, five are common to most situations: determining objectives, selecting media, sequencing content, evaluating student performance, and organizing the instructional development process. To be sure, these responsibilities are fulfilled in cooperation with a team of content specialists and evaluators, but they are the areas in which an instructional designer normally works. There is the temptation to approach decision-making in each of these areas with only logical or scientific criteria in mind. In stating objectives, we analyze tasks to determine their smallest components. While this is useful for the instructor and designer in understanding the instructional task, the proliferation of objectives at such a level of specificity results in confusion for the

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student. At the extreme, objectives, content and test items become synonymous. We sometimes forget the modest purpose of objectives to generate expectation, or leaning set towards the task.

When selecting media, we seek literally to apply taxonomies of media characteristics ignoring that students may not choose or be able to learn in that form because a cost-effective delivery system may not exist. As a result of detailed analyses of prerequisite tasks, we sometimes become too prescriptive. We forget that there are many defensible ways of sequencing instruction, and that the student may choose to learn in his own idiosyncratic way (ways we can only now guess at). There is the need to be flexible, outline options.

In evaluating student performance, we have become so concerned with grading that we forget the governing concepts of our curriculum.

Finally, in organizing the instructional development process, we sometimes naively insist on completing every step in a long, complex model of development. In each of these areas, applying only logical and scientific criteria to the design of instruction early only frustrates results and leads to failure. A realism is needed, and that realistic perspective can be achieved by keeping four questions in mind when approaching each development problem. Has the student, the utlimate user of instructional materials, been considered? Has the teacher, who will implement the materials on a day-to-day basis, been kept firmly in mind? Do the broach philosophical concepts that characterize the curriculum focus the instructional development process? Are instructional materials developed to fit into the structure of local instructional programs with

minimal difficulty? Each of these questions consistutes another level of decision-making in instructional development. The scope of this paper includes a demonstration of how these general questions are being answered in relation to each important development task in the Dental Auxiliary Education Project.

A BRIEF DESCRIPTION OF THE DENTAL AUXILIARY EDUCATION PROJECT

In 1971, the State of Washington revised its dental practice act, significantly expanding the scope of practice for dental hygienists and dental assistants. In response to this legislative action, each dental auxiliary education program in the state had to make substantial curricular changes. Subsequently, a statewide approach to curriculum development was initiated in 1973 by auxiliary educators. A curriculum task force was established to identify the problems associated with educating expanded function dental auxiliaries, and to design model curricula which address these problems.

A common denominator had to be identified between the state's fifteen dental assisting and dental hygiene programs, located in five institutional settings including: vocational/technical institutes, community colleges, a proprietary school, four-year colleges, and the University of Washington School of Dentistry. The skills taught to dental auxiliary students were identified as this commonality -- around these skills the model curricula were developed.

First, the dental auxiliary educators in the state identified and validated a list of approximately eighty-five separate tasks which they considered as essential components of a dental auxiliary curriculum.

Next, objectives, performance criteria and competency levels were developed for each task and subsequently validated by the educators. These were published under the title Competency Criteria and Objectives for Dental Auxiliary Education, Volumes I-IV. These tasks were then arranged into instructional units and the units into the model dental assisting and dental hygiene curricula. The resulting curricula:

1. are competency-based;
2. provide core curricula;
3. provide a mechanism for a career ladder and lattice;
4. consist of modularized learning units;
5. provide for self-paced, individualized learning;
6. offer options to exit at various stages with employable skills;
7. contain available time for elective coursework; and
8. present a workable framework for ongoing continuing education.

In January, 1977 the Kellogg Foundation awarded a five-year grant to fund the Dental Auxiliary Education Project at the University of Washington, to develop instructional materials for the curricula, and to implement the model curricula in ten of the fifteen accredited dental auxiliary programs in Washington.

LEVEL 1: THE STUDENT

It has been argued in the past that the instructional designer should represent the interests of the student in developing instructional materials. This might be an appropriate role for the designer, since he/she is usually naive to the specific content being taught. However, the designer's work is for his most immediate client, the instructor. If our clients were

students, we might be called learning designers. It is here that a major problem exists in designing instructional materials that are to be used by students "in the field". For whatever work we accomplish for the instructor needs to be designed for the student. An excellent example is the use of task analysis for the determination of objectives. If the designer has led his client through the process well, the product will be a rather lengthy and technical description of the aims of instruction. In the D.A.E. Project, we work from a four-volume set of such aims, Competency Criteria and Objectives for Dental Auxiliary Education, Vols. I-IV. Their use is primarily intended for curriculum specialists and teachers. However, in the course of developing instructional materials from these objectives, they have undergone considerable translation. In fact, we will be including within student guides information on how to use the objectives for study purposes.

In selecting media for instruction, we usually try to match characteristics of particular media to types of learning tasks. For example, if a procedural task is to be learned, some medium incorporating motion would be the medium of choice. However, in determining the form instructional materials will take in the D.A.E. Project, decisions were made not only with the goal of facilitating student mastery of the skills in the curricula in mind, but with an eye to how the materials actually will be used by students and teachers.

A survey of cooperating dental auxiliary education programs revealed a wide variety in the type and quantity of instructional equipment and facilities available. This constraint has led us to rely on illustrated

written materials supplemented by color slides and audio tapes, where videotape or 16 mm film would have been the medium of choice to teach many of the motor skills in the curricula. We do not anticipate that this will cause significant problems. In fact, it may be advantageous in several ways. First, it makes the D.A.E. materials relatively inexpensive and easy to use. Secondly, because the modules omit important visualization of motion, the faculty will have an important instructional role to fulfill in providing adequate demonstrations of the skills.

When determining an optimum sequence of instruction, instructional designers frequently rely on task or content analyses. These analyses usually result in a detailed analysis of the prerequisite knowledge, attitudes, and skills needed to perform a specific task. However, students will always choose to learn in their own idiosyncratic way. Rigidity must be avoided. Sequencing of instruction within the D.A.E. modules is based on our best estimate of what will facilitate learning. That estimate is based upon the idea that skill learning progresses from the simple forms of learning to the more complex. There are many defensible ways of sequencing instruction, so we have tried to be flexible in our approach to the problem and consider how the materials might ultimately be used by students and teachers. The balance we have struck in this area is one we believe still enables us to call our materials "individualized". Within modules, we will generally be recommending students proceed in a one-two-three fashion, because there is a clear, orderly relationship between the topics. In other situations where there are no clear prerequisite relationships, students and their

tutors can make their choice on dealing with instruction in any sequence they wish, as long as it facilitates mastery.

In evaluating student performance, the emphasis in the past has been on testing at the end of instruction for purposes of grading. If the student has been kept in mind during the instructional development process, interspersed at appropriate intervals will be self-tests and practice activities designed to give students information on their progress toward mastery of the module's objectives. Such is the case with D.A.E. instructional modules.

Finally, the student needs to be involved directly in the instructional development as much as possible. Within the D.A.E. Project, field-testing for each module is scheduled to include students from at least two separate institutions. An attempt will be made to test any given module in two different types of institutions. For skills common to both dental assisting and dental hygiene, each program type will be represented.

LEVEL 2: THE TEACHER

While students are the ultimate users of instructional materials, the degree to which the materials have been designed with the classroom teacher in mind will determine whether they are successfully implemented. In the first instance, the statement of objectives, content specialists will need to provide a unifying vision of what content needs to be presented. In the D.A.E. Project, faculty in the State of Washington first participated in the work of a curriculum task force that led to the publication of Competency Criteria and Objectives for Dental Auxiliary Education. Now that instructional development of materials is under way, faculty in the state

will have a chance to reevaluate the objectives as they are used to develop instructional modules. This will occur at two stages: in the module review process and during field-testing.

A major concern of teachers with the advent of sophisticated technologies of instruction has been the fear of a shrinking role in classroom instruction. The instructional designer, in the process of developing material, should be aware of this concern and be careful to outline the major responsibilities and options for instructors in using them with students. Looked at from the standpoint of a curriculum, the instructional materials are only one element. Students and teacher using the materials to create learning experiences are other elements. A modest approach to the design of the materials is best, and it is best when the teacher is seen as the most important element in a classroom. In the D.A.E. Project, the central roles of the instructor as a creator of instructional materials, manager of learning, evaluator and diagnostician of learning are recognized. The instructional modules leave open the option for instructors to demonstrate effectively clinical skills in person or through the creation of videotapes. In faculty guides that will accompany each module, teachers will be provided guidelines for evaluating performance on formative and summative tests.

One unique problem that has arisen in the D.A.E. Project is the Project team's desire to link instruction of essential basic science information to the instruction of clinical skills. However, in some cooperating institutions there exist structured courses which teach basic science apart from clinical application. In order to avoid displacement of instructors who teach these courses, the linkage of basic science to clinical

skills has been accomplished in such a way as to provide options for local programs. A) Structured science courses may be eliminated while providing the instruction as needed throughout the curricula. B) Traditional sciences courses may be maintained while assisting the instructors in selection of pertinent content. This is achieved by giving instructors the objectives from all modules which contain basic science components related to their area of concern.

The first option would alleviate the problem some programs have in obtaining personnel to teach the needed basic and dental sciences. The second option would allow programs well-staffed with qualified science instructors to retain these valuable resources and would enhance the probability that all essential science-related information is included in the appropriate course.

These options are created by structuring materials so that basic science components can be separated from individual modules (without impairing that module's integrity) and reassembled in a more structured fashion.

LEVEL 3: THE CURRICULUM

On a large curriculum project in which over 120 different instructional modules are developed, because of the many decisions that need to be made, it is easy to lose sight of the philosophical concepts which govern the entire curriculum. For instance, does each module embody the curricular concept of individualization? When instruction so explicitly "designed", as in the D.A.E. curriculum, it is particularly easy to lose track and become very prescriptive. Yet, we have avoided this problem. In sequencing content, we have outlined alternative pathways for students to follow through each module. In selecting content, we have allowed options for individual

institutions to teach basic science with or separate from clinical instruction. In clinical instruction, the use of locally produced videotapes will give an individual character to skill instruction in that institution. The individual instructors will work closely with students in evaluating learning in relation to the individual student's preference in the module's learning objectives rather than in relation to other students' performances.

LEVEL 4: INSTITUTION

A new curriculum evolves a "logic" or "structure" of its own in the course of its development. In part that "structure" is based upon such concepts as individualization, or "competency-based". However, to implement that curriculum successfully and the logic on which it is based, some effort must be made in the design stage to articulate that structure with instructional practices in implementing institutions. For example, those responsible for curriculum implementation in the D.A.E. Project have been careful to relate the content of the 120 instructional modules in development in terms of the existing course content. Much effort has been devoted to develop guidelines for evaluation which will enable the assignment of grades on the basis of tests of clinical competency. In selecting appropriate media, available equipment in implementing instutions has been taken into account.

SUMMARY

The concerns and questions addressed in this paper obviously make the instructional development process very complex. Most of the answers to the questions, when they do arise in the course of a specific project, are not found in neat models of the instructional development process. However,

instructional developers cannot be concerned only for the logical or technical quality of the materials that sit before them. The products of their work must take into account several different audiences: the students, the teachers, the curriculum, and the institutions. The degree to which the materials, as designed, address the concerns at each of these levels will determine whether the products will become reference works in a library or will be used daily by students and teachers.